

RAND Research Brief

An Evolving Agile Combat Support System

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The development of Expeditionary Aerospace Force (EAF) operations requires rethinking of many Air Force functions, including the combat support system. To a large extent, EAF success depends on turning the current support system into one that is much more agile. In recognition of this, the U.S. Air Force has begun transforming the current support system into an Agile Combat Support (ACS) system. It has designated the ACS system as one of six essential core competencies for global engagement.

The Air Force faces ACS design tradeoffs between speed and costs. These tradeoffs will change as support technologies, policies, and practices change. ACS planning must therefore be continuous. Developing the ACS system requires decisions on allocating limited resources for meeting the needs of expeditionary operations that vary widely in size and location. Some forward positioning of resources will be required. RAND, in partnership with the Air Force Logistics Management Agency (AFLMA), has been researching both current support system needs and how these may evolve as threats, technology, and support processes change.

THE NEED FOR PREPOSITIONING

Our research indicates that the Air Force goal of deploying a nominal expeditionary force—or a 36-ship force capable of initiating and sustaining operations to suppress air enemy air defenses, attain air superiority, and attack enemy ground targets—within 48 hours can now be met only under certain conditions.

Figure 1 shows the results generated from a RAND-developed model that minimizes support costs and meets employment timelines while satisfying resource requirements for a 7-day surge employment scenario. These results were obtained from our employment-driven commodity models that computed initial and follow-on oper-

ating requirements (IOR and FOR) for munitions, fuel, vehicles, shelters, F-15 avionics components, and Low-Altitude Navigation and Targeting Infrared for Night (LANTIRN) systems for a nominal expeditionary force.

	Forward operating location	Forward support location	CONUS
48 hours	Bombs (IOR) Fuel FMSE Shelter Vehicles	Missiles (IOR & FOR) Bombs (FOR) Repair: avionics and engines	Unit equipment
96 hours	Bombs (IOR) Fuel Shelter Vehicles	Bombs (FOR), FMSE Repair: avionics and engines	Unit equipment Missiles (IOR & FOR)
144 hours	Fuel	Bombs (IOR & FOR) Repair: avionics and engines Shelter Vehicles	Unit equipment Missiles (IOR & FOR) FMSE

Deployment times and distances are based on Southwest Asia. FOLs are assumed to have adequate runway and ramp space. FMSE = Fuel Mobility Support Equipment. CONUS = continental United States.

SOURCE: MR-1075-AF.

Figure 1—Resource Positioning by Timeline Requirements

A 48-hour timeline requires fuel, shelter, vehicles, and the IOR for bombs to be prepositioned at a Forward Operating Location (FOL). A bare base, or one where only fuel is prepositioned, can be used only if the deployment timeline is extended to 144 hours, substantial materiel is prepositioned at a regional Forward Support Location (FSL), and transportation is available to move resources between the FSLs and FOLs.

Substantial prepositioning is needed for rapid deployments because current support resources and processes are heavy. They were not designed for quick deployments to FOLs with limited space for unloading strategic airlift. The airlift required for moving today's support equipment is very large, and it may not always be available. Shelter needs place an additional constraint on

options for quick deployment. The current Harvest Falcon shelter package for bare bases requires approximately 100 C-141 (or 72 C-17) loads to move and almost four days to erect using a 150-man crew. The construction time alone means this shelter package must be prepositioned to meet timelines of 48 or even 96 hours.

Our results do not mean expeditionary operations are impossible. Technology and process changes may reduce the need to deploy heavy maintenance equipment. For now, however, these results do mean that designing an infrastructure to support expeditionary operations raises a series of complicated tradeoffs. Bases capable of launching expeditionary surge operations within 48 hours may best be reserved for areas such as Europe or Southwest Asia that are critical to U.S. interests or are under serious threat. In other areas, a 144-hour response may be adequate. For humanitarian operations, deployment to a bare base within 48 hours is possible because combat equipment is not needed.

COMPONENTS OF AN AGILE COMBAT SUPPORT SYSTEM

The need for a support system that meets current expeditionary combat operations requirements and can adapt to evolving processes and technologies suggests that any such system have five elements:

- FOLs, with some in critical areas having substantial amounts of prepositioned equipment and others in less critical areas being more austere.
- FSLs, whose configuration and function would depend on their locations, the presence of threats, and the costs and benefits of using current facilities.
- Continental United States Support Locations (CSLs). Depots and contractor facilities are types of CSLs; others may be analogous to FSLs and established at major Air Force bases or civilian transportation hubs.
- A transportation network, including en route tanker support connecting the FOLs and the FSLs with each other and with the continental United States.
- A logistics command and control system for organizing transport and support activities.

Figure 2 shows a possible network of FOLs, FSLs, and CSLs. Their configuration will vary based on local infrastructure and force protection and political considerations such as how site locations may affect alliances and possible restrictions on the use of facilities and materiel for missions against certain states.

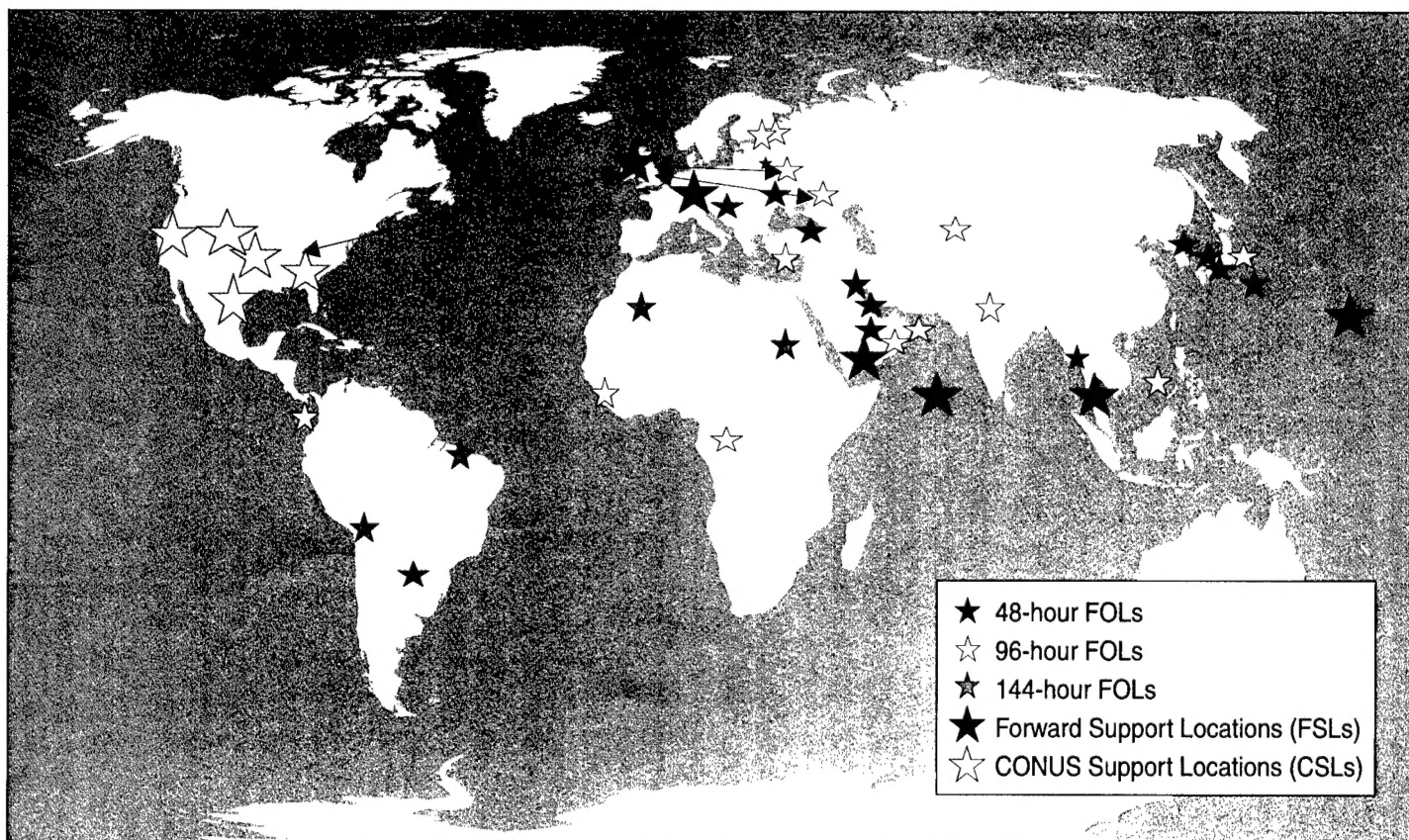


Figure 2—Potential Global ACS Network

A SYSTEM THAT EVOLVES AS ITS GOALS EVOLVE

How might the ACS system evolve as the goals for expeditionary operations evolve? Changes in support technologies and the force structure can help the support system achieve employment goals and more rapid deployment. Reductions in munitions weight and assembly times can help speed deployment. For operations at bases where shelter must be established, the development and deployment of lighter-weight shelters can increase deployment speed and decrease the deployment footprint. Adopting the Advanced Deployment Kit (ADK) for LAN-TIRN pod repair or the new Electronic System Test Set for F-15 avionics intermediate maintenance, for example, helps cut the deployment footprint—reducing the need for strategic airlift to move support equipment—thereby achieving more rapid overall deployment.

New aircraft and weaponry can cut the need for bulky support equipment. The F-22 is designed to have one-half the support footprint of the F-15, and the Joint Strike Fighter will reduce support requirements as well. Air Force war games, particularly the Future Capabilities games, have experimented with radically different forces relying on standoff capabilities or space-based weapons. All of these developments will lead to changes in both

support requirements and in the options that are most attractive under peacetime cost constraints.

PLANNING FOR AN EVOLVING SYSTEM

Strategic planning for an ACS system that evolves over time must be global. A global perspective is needed because the combination of cost constraints, changing support characteristics, and political considerations may require that some support for a particular scenario be provided from another region. This is not a theoretical point. Much of Southwest Asia is politically volatile, and support there might better be provided from outside the region as, indeed, some is now from Europe and Diego Garcia Island. Geographical areas of critical interest will change over time, as will the specific threats within them.

RAND and the AFLMA are continuing to research these issues. We are focusing on the areas where new technology or processes can have the greatest effect on improving expeditionary support performance. New technologies, political developments, and budget changes will require continual reassessment of the support system, and we are designing analytical models for this reassessment.

RAND research briefs summarize research that has been more fully documented elsewhere. This research brief describes work done for RAND's Project AIR FORCE; it is documented in Supporting Expeditionary Aerospace Forces: A Concept for Evolving the Agile Combat Support/Mobility System of the Future, by Robert S. Tripp, Lionel Galway, Timothy L. Ramey, Mahyar Amouzegar, and Eric Peltz, MR-1179-AF, 2000, 49 pp., ISBN 0-8330-2852-9, available from RAND Distribution Services (Telephone: 310-451-7002; FAX 310-451-6915; Internet: order@rand.org). Abstracts of RAND documents may be viewed on the World Wide Web (<http://www.rand.org>). RAND® is a registered trademark. RAND is a nonprofit institution that seeks to improve public policy through research and analysis. Its publications do not necessarily reflect the opinions or policies of its research sponsors.

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